Trigonometric Principles and Applications

Trigonometry · Answer Key · 20 Questions

1. In the unit circle, what is the value of the cosine of an angle theta when the terminal side lies on the positive y-axis?

A) 0
B) 1
C) -1
D) Undefined

2. Which trigonometric function represents the ratio of the opposite side to the hypotenuse in a right-angled triangle?

A) Cosine
B) Tangent
C) Sine
D) Secant

3. What is the period of the standard sine function f(x) = sin(x)?

A) pi
B) 2*pi
C) pi/2
D) 4*pi

4. In the context of the Law of Cosines, what does the formula c^2 = a^2 + b^2 - 2ab*cos(C) allow one to calculate?

A) The area of a triangle
B) The angle of a right triangle
C) The length of a side of any triangle
D) The volume of a tetrahedron

5. What is the relationship between the tangent function and the sine and cosine functions?

A) tan(x) = cos(x)/sin(x)
B) tan(x) = sin(x)*cos(x)
C) tan(x) = sin(x)/cos(x)
D) tan(x) = 1/sin(x)

6. The Pythagorean identity states that sin^2(x) + cos^2(x) is equal to what value?

A) 0
B) 1
C) 2
D) tan(x)

7. Which trigonometric function is defined as the reciprocal of the cosine function?

A) Cosecant
B) Secant
C) Cotangent
D) Sine

8. In navigation and geodesy, what is the value of the tangent of 45 degrees?

A) 0
B) 0.5
C) 1
D) sqrt(3)

9. According to Euler's formula, e^(ix) is equal to which trigonometric expression?

A) sin(x) + i*cos(x)
B) cos(x) + i*sin(x)
C) cos(x) - i*sin(x)
D) sin(x) - i*cos(x)

10. Which quadrant of the Cartesian plane is the cosine function positive while the sine function is negative?

A) Quadrant I
B) Quadrant II
C) Quadrant III
D) Quadrant IV

11. What is the value of sin(pi/6) in degrees?

A) 0.5
B) 0.707
C) 0.866
D) 1

12. In a right-angled triangle, the sum of the two non-right angles is always equal to how many degrees?

A) 45
B) 90
C) 180
D) 360

13. What does the inverse sine function, arcsin(x), return when the input is 1?

A) 0
B) pi/4
C) pi/2
D) pi

14. The conversion of polar coordinates (r, theta) to Cartesian coordinates (x, y) uses which formula for x?

A) x = r*sin(theta)
B) x = r*cos(theta)
C) x = r*tan(theta)
D) x = r/cos(theta)

15. Which of these functions is an odd function, meaning f(-x) = -f(x)?

A) cos(x)
B) sec(x)
C) sin(x)
D) cos^2(x)

16. What is the value of the cotangent of 90 degrees?

A) 0
B) 1
C) -1
D) Undefined

17. How many radians are equivalent to one full rotation around a circle (360 degrees)?

A) pi
B) 2*pi
C) pi/2
D) 3*pi

18. In terms of signal processing, what are sine and cosine waves used to describe?

A) Direct current
B) Harmonic oscillation
C) Static friction
D) Thermal expansion

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19. Which trigonometric identity describes the relationship between the secant and tangent functions?

A) 1 + tan^2(x) = sec^2(x)

B) 1 + sec^2(x) = tan^2(x)

C) tan^2(x) - sec^2(x) = 1

D) sin^2(x) + sec^2(x) = 1

20. What is the slope of a line that makes a 60-degree angle with the positive x-axis?

A) 1

B) sqrt(3)

C) 1/sqrt(3)

D) 0.5

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